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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
LAMB, CHRISTOPHER RAY	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/684,461	**Applicant(s)** IKENAKA, KIYONO	
	Examiner Christopher R. Lamb	**Art Unit** 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _21 February 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,3-5,7-9,11-23,27,29-31 and 33-83_ is/are pending in the application.

4a) Of the above claim(s) _See Continuation Sheet_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,3-5,11,14,17,23,25-27,33,36,54,60-62,65-67,70 and 71_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 7-9,12,13,15,16,18-22,29-31,34,35,37-53,55-59,63,64,68,69 and 72-83.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 22nd, 2008 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 11, 14, 23, 25, 33, 36, 60, 61, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiono et al. (US 6,834,036) in view of Ohtaki et al. (US 6,449,095).

Regarding claim 1:

Shiono discloses (the sixth embodiment, Fig. 8, is relied upon, but some elements are described in earlier embodiments):

An optical element for use in an optical pickup apparatus which comprises

a first light source having a wavelength λ1 (column 11, lines 40-50), a “third” light source having a wavelength λ3 (1.6·λ1≤λ3≤2.0·λ1 and λ2<λ3) (column 11, lines 40-50: this is Shino’s second light source, but since its wavelength matches the third light source of the claim, it will be referred to as a “third light source”), and

a light converging system including an optical element (Fig. 8),

wherein the light converging system converges a light flux from the first light source onto an information recording plane of a first optical information recording medium through a protective layer having a thickness t1 (0.5 ≤ t1(mm) ≤ 0.7mm) so that recording and/or reproducing information is conducted for the first optical information recording medium (this corresponds to the high-density disk of column 12, lines 1-20: the thickness is not disclosed in Shiono but from the capacity and the numerical aperture it corresponds to a HD-DVD, which has a protective layer with a thickness of 0.6 mm),

converges a light flux from the third light source onto an information recording plane of a third optical information recording medium through a protective layer having a thickness t3 (1.1 ≤ t3 (mm) ≤ 1.3) so that recording and/or reproducing information is conducted for the third optical information recording medium (this corresponds to the CD disk of column 12, lines 1-20),

the optical element comprising:

a first diffractive structure on at least one surface thereof (Fig. 8: 19a),

wherein when recording and/or reproducing is conducted for the first and third information recording mediums respectively, a light flux emitted from each of the first, second and third light sources passes in common through the first diffractive structure and thereafter is converged respectively to form a light spot on an information recording plane of the first and third optical information recording mediums (Fig. 8; column 12, lines 1-20),

wherein, when a wavelength changes to become longer, the first diffractive structure has an optical characteristic to make the spherical aberration of a light flux having passed through the diffractive structure to be under (column 20, line 55 to column 21, line 10: Shiono does not use the term "under," but discloses that when the wavelength becomes longer, the diffractive structure shortens the focal length of the lens, which is the same thing), and

wherein in a case that a light flux having a wavelength λ1 or λ3 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the first diffractive structure is n1 in the light flux having the wavelength λ1 and n3 in the light flux having the wavelength λ3, the following formula is satisfied: n1=2, n3=1 (column 12, lines 25-55).

Shiono does not disclose (in this embodiment):

a second light source having a wavelength λ2 (λ1<λ2);

wherein the light converging system converges a light flux from the second light source onto an information recording plane of a second optical information recording medium through a protective layer having a thickness t2 (0.5 ≤ t2 (mm) ≤ 0.7) so that recording and/or reproducing information is conducted for the second optical information recording medium;

wherein in a case that a light flux having the wavelength $\lambda 2$ comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the first diffractive structure is n2 in the light flux having the wavelength $\lambda 2$, the following formula is satisfied: $n2=1$.

Ohtaki discloses:

a second light source having a wavelength $\lambda 2$ ($\lambda 1<\lambda 2$) (column 1, lines 5-30: the wavelength for DVDs is longer than the wavelength for HD-DVDs);

wherein the light converging system converges a light flux from the second light source onto an information recording plane of a second optical information recording medium through a protective layer having a thickness t2 ($0.5 \leq t2 \text{ (mm)} \leq 0.7$) so that recording and/or reproducing information is conducted for the second optical information recording medium (column 1, lines 5-30: the thickness of a DVD's protective layer is 0.6 mm);

wherein in a case that a light flux having the wavelength $\lambda 2$ comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the first diffractive structure is n2 in the light flux having the wavelength $\lambda 2$, the following formula is satisfied: $n2=1$ (column 7, lines 35-60).

It would have been obvious to one of ordinary skill in the art to include in Shiono a second light source having a wavelength $\lambda 2$, to use that light source to read information from recording media with a protective layer of thickness t2, and to use the first order diffracted light with that wavelength, as taught by Ohtaki.

The motivation would have been to have an apparatus compatible with all three of HD-DVDs, DVDs, and CDs.

Regarding claim 3:

Shiono in view of Ohtaki discloses wherein when the optical system magnification of the optical element for the wavelength $\lambda 1$ is m1, the following formula is satisfied: m1 = 0 (all this means is that the beam enters the optical element as parallel rays: this is apparent in Shiono Fig. 7).

Regarding claim 11:

Shiono in view of Ohtaki discloses wherein when the optical system magnification of the optical element for the wavelength $\lambda 2$ is m2, the following formula is satisfied: m2=0 (this is similar to claim 3: in Shiono the beam enters the optical element as a parallel ray; likewise in Ohtaki Fig. 5 it is clear the beam enters the optical element as a parallel ray).

Regarding claim 14:

In Shiono in view of Ohtaki the optical element is an objective lens (Shiono Fig. 8).

Regarding claims 23, 25, 33, and 36:

All elements positively recited in the claims have already been identified with regards to earlier claims. No further elaboration is necessary.

Regarding claim 60:

In Shiono in view of Ohtaki the third light source is a hololaser (the photodetectors and laser are integrated as per Fig. 7).

Regarding claim 61:

In Shiono in view of Ohtaki a first chromatic correcting element to achromatize a light flux having a wavelength λ1 is located on an optical path of the light flux having the wavelength λ1 (Shiono Fig. 7: the first chromatic correcting element is the diffraction grating).

Regarding claim 65:

In Shiono in view of Ohtaki a collimator is located on an optical path on which the light flux having the wavelength λ1 and the light flux having the wavelength λ2 pass in common (Shiono Fig. 7).

4. Claims 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiono in view of Ohtaki.

Regarding claim 62:

Shiono in view of Ohtaki discloses an optical pickup apparatus as discussed above.

Shiono in view of Ohtaki doesn't disclose (in the embodiment relied upon) wherein a second chromatic correcting element to achromatize a light flux having a wavelength λ2 is located on an optical path of the light flux having the wavelength λ2.

Shiono discloses that to increase the light utilization efficiency, a separate diffractive optical element can be positioned only in the optical path of the beam of each wavelength (column 1, lines 50-67).

It would have been obvious to one of ordinary skill in the art to include in Shiono in view of Ohtaki wherein there is a separate diffractive optical element (that is, a chromatic correcting element) in the path of the beam of each wavelength: thus a second chromatic correcting element to achromatize a light flux having a wavelength λ2 is located on an optical path of the light flux having the wavelength λ2.

The motivation would have been to increase the light utilization efficiency.

5. Claims 66, 67 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiono in view of Ohtaki as applied to claim 65 above, and further in view of Ando (US 6,252,686).

Regarding claim 66:

Shiono in view of Ohtaki disclose an optical pickup apparatus as discussed above.

Shiono in view of Ohtaki does not disclose:

"wherein a first beam shaper to shape a light flux having the wavelength λ1 is located at a light source side than the collimator on an optical path on which the light flux having the wavelength λ1 passes."

Ando discloses:

wherein a first beam shaper to shape a light flux having the wavelength λ1 is located at a light source side than the collimator on an optical path on which the light flux having the wavelength λ1 passes (Fig. 1; column 4, lines 45-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Shiono in view of Ohtaki wherein wherein a first beam shaper to shape a light flux having the wavelength λ1 is located at a light source side than the collimator on an optical path on which the light flux having the wavelength λ1 passes.

The motivation would have been to improve the shape of the focused beam (Ando column 1, lines 50-67 discloses the problems that occur without beam shaping).

Regarding claim 67:

Shiono in view of Ohtaki, and further in view of Ando:

the first beam shaper corrects chromatic aberration for a light beam having the wavelength λ1 (Ando column 10, line 60 to column 11, line 5: the beam shaper can be designed to decrease the wavelength, or chromatic, aberration).

Regarding claim 70:

This claim is similar to claim 66 and is similarly rejected (in Shiono in view of Ohtaki the two beams already share a common light path).

6. Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiono in view of Ohtaki as applied to claim 65 above, and further in view of Applicant's admitted prior art.

Shiono does not specifically disclose "wherein the collimator is made of a plastic material." Shiono does not disclose what the collimator is made from.

In a previous Office Action the Examiner took Official Notice that lenses made from plastic materials are well known in the art. Applicant did not traverse the taking of Official Notice and therefore this fact is taken as admitted prior art.

It would have been obvious to one of ordinary skill in the art to include in Shiono wherein the collimator is made of a plastic material.

The motivation would have been to, for example, use a lighter material than glass.

7. Claims 1, 4, 5, 14, 17, 23, 26, 27, 36, and 54 are rejected under 35 U.S.C. 103(a) as being obvious over Kimura et al. (US 2003/0185134) in view of Ohtaki.

Kimura constitutes prior art under either 35 U.S.C. 102(a) or 102(e).

Regarding 102(a): Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Regarding 102(e): The applied reference has a common assignee with the instant application. This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claim 1:

Kimura discloses:

An optical element for use in an optical pickup apparatus which comprises a first light source having a wavelength $\lambda 1$ (paragraphs 365-366),

a second light source having a wavelength $\lambda 2$ ($\lambda 1<\lambda 2$) (paragraphs 365-366),

a third light source having a wavelength $\lambda 3$ ($1.6\cdot\lambda 1\leq\lambda 3\leq 2.0\cdot\lambda 1$ and $\lambda 2<\lambda 3$) (paragraphs 365-366), and

a light converging system including an optical element (paragraphs 367-368),

wherein the light converging system converges a light flux from the first light source onto an information recording plane of a first optical information recording medium through a protective layer having a thickness t1 so that recording and/or reproducing information is conducted for the first optical information recording medium (paragraphs 364, 367),

converges a light flux from the second light source onto an information recording plane of a second optical information recording medium through a protective layer having a thickness t2 ($0.5\leq t2\leq 0.7$) so that recording and/or reproducing information is conducted for the second optical information recording medium (paragraphs 364, 368), and

converges a light flux from the third light source onto an information recording plane of a third optical information recording medium through a protective layer having a thickness t3 ($1.1\leq t3(\text{mm})\leq 1.3$) so that recording and/or reproducing information is conducted for the third optical information recording medium (paragraphs 364, 368),

the optical element comprising:

a first diffractive structure on at least one surface thereof (paragraph 360), wherein when recording and/or reproducing is conducted for the first, second and third information recording mediums respectively, a light flux emitted from each of the first, second and third light sources passes in common through the first diffractive structure and thereafter is converged respectively to form a light spot on an information recording plane of the first, second and third optical information recording mediums (Fig. 2,

wherein, when a wavelength changes to become longer, the first diffractive structure has an optical characteristic to make the spherical aberration of a light flux having passed through the diffractive structure to be under (paragraphs 443-444), and

wherein in a case that a light flux having a wavelength λ1 or λ3 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the first diffractive structure is n1 in the light flux having the wavelength λ1 and n3 in the light flux having the wavelength λ3 (n1 and n3 are a natural number respectively), the following formula is satisfied: n1=2, n2=1, n3=1 (paragraph 370).

Kimura does not disclose:

$0.5 \le t1\ (mm) \le 0.7$.

In short, Kimura discloses using second order diffracted light of a first wavelength to read from a blu-ray disc with a thickness t1 of 0.1 mm, rather than from an HD-DVD disc with a thickness t1 of 0.6 mm.

Ohtaki discloses an HD-DVD disc with a thickness t1 of 0.6 mm (column 1, lines 25-50). Ohtaki discloses that second order diffracted light of a first wavelength can be used to read this disc (column 7, lines 5-50).

It would have been obvious to one of ordinary skill in the art wherein the second order diffracted light of the first wavelength of Kimura is used to read from a disc where the thickness of the protective layer meets the formula $0.5 \le t1 \text{ (mm)} \le 0.7$.

The motivation would have been to read HD-DVD discs.

Regarding claims 4 and 5:

Kimura discloses that m3 falls within the range of –0.25 to –0.05 (paragraph 38). The value of 0.075, for example, falls within this range and also within the ranges of claims 4 and 5.

Regarding claim 14:

In Kimura the optical element is an objective lens (paragraph 359).

Regarding claim 17:

In Kimura, at least one optical surface of the optical element comprises a first region (paragraph 369, Fig. 1: region NA3), and

a second region which is further from the optical axis than the first region (paragraph 369)

wherein a light flux having any one of wavelengths $\lambda1$, $\lambda2$, and $\lambda3$ emitted respectively from the first, second, and third light sources passing through the first region is used for recording and/or reproducing for the first, second, and third optical information recording mediums respectively (paragraph 369), wherein a light flux having a wavelength λ3 from the third light source passing through the second region is not used for recording and/or reproducing for the third optical information recording medium (paragraph 369),

wherein the first diffractive structure is provided on the first region and a second diffractive structure is provided on the second region (paragraph 369),

wherein when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ1 generated by the first diffractive structure is n1A, an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ2 generated by the first diffractive structure is n1D, an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ1 generated by the second diffractive structure is n2A, and an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ2 generated by the second diffractive structure is n2D, the following formula is satisfied: n1A:n1D≠n2A:n2D (this formula simply states that the ratio of the diffraction orders for the first and second wavelengths are different between regions. Kimura, paragraph 391, states that different order lights may be used in each area: based upon the possible diffraction order examples given by Kimura, if a different order light is used between regions, the ratio will also be different).

Regarding claims 23, 26, 27, 36, and 54:

All elements positively recited have been identified with respect to earlier rejections. No further elaboration is necessary.

Response to Arguments

8. Applicant's arguments filed February 21st, 2007 have been fully considered but they are not persuasive.

Applicant first argues that Shiono in view of Ohtaki does not disclose "wherein, when a wavelength changes to become longer, the first diffractive structure has an optical characteristic to make the spherical aberration of a light flux having passed through the diffractive structure to be under."

However, Shiono does disclose this in column 20, line 55 to column 21, line 10. Shiono does not use the term "under," but discloses that when the wavelength becomes longer, the diffractive structure shortens the focal length of the lens, which is the same thing.

Applicant next argues that Ohtaki does not teach this element. Since it already present in Shiono this is irrelevant.

It should be noted that the Examiner did rely upon a different embodiment of Shiono (Fig. 5) for claims 4, 5, 26, and 27. The embodiment of Fig. 5 does not explicitly disclose making the spherical aberration "under," and therefore the rejection of these claims as unpatentable over Shiono in view of Ohtaki has been withdrawn. Note that these claims are still rejected as unpatentable over Kimura in view of Ohtaki.

Applicant next argues with the rejections over Kimura in view of Ohtaki. Applicant argues that Kimura in view of Ohtaki does not disclose the same element: that the spherical aberration is made "under" by the diffractive structure.

In this case, Applicant acknowledges that Kimura discloses just this, but argues that Kimura does disclose this element in an embodiment that has the correct diffraction orders (i.e., second order for the first wavelength and first order for the others).

However, in paragraphs 443-444, Kimura discloses an example with these diffractive orders wherein the spherical aberration becomes under as the wavelength becomes longer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Lamb whose telephone number is (571) 272-5264. The examiner can normally be reached on 9:00 AM to 5:30 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 262-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph H. Feild/
Supervisory Patent Examiner, Art
Unit 2627

CRL 3/24/08